Regulatory Services News

Vol. 55, No. 2 Feed - Fertilizer - Milk - Seed - Seed Testing - Soil Testing Summer 2011

Director's Digest

Producers are having some challenges with the weather for timely planting of crops. As I write this article, recent word in agricultural news for the last week of April indicated that 9% of the 2011 corn is planted compared to 44% in 2010. Seed dealers may experience more producers seeking to exchange for earlier maturing varieties for planting. Several thousand acres of low lying land next to our major rivers will likely have very late planted crops this year. One good aspect is that the heavy rains following early fertilizer applications to pastures have created a very green looking oasis in many parts of Kentucky.

The Poundstone Building is looking greener these days as part of a UK program mentioned in the Spring issue of *Regulatory Services News*. All of the overhead fluorescent lights in our building have been replaced with lights using 25% less electricity, our water using devices in restrooms have been replaced with low volume devices, and installing solar panels on the roof to assist our hot water needs will follow during the summer months.

Our inspectors in the Division have continued their diligence with inspection and monitoring through the early spring months. While this is what is normally expected, we realize that during periods of high prices, we are challenged with keeping those "special deals" or low quality products from reaching our producers and consumers. The recent employment of an additional field inspector will result in more thorough coverage of products marketed in smaller packages. The number of small packaged products registered in the feed, fertilizer and seed regulatory programs has increased substantially in the past two years.

Bill Thom
Director

What's inside...

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The Fusarium Watch is On in Wheat Fields

Each Spring, we closely watch the weather and wheat fields to anticipate the potential incidence of head scab. To some degree each season, Fusarium head blight (FHB) is present, but the effect on seed crops varies because of environmental conditions and disease pressure. Infection occurs during flowering and bleached heads may be noticeable in fields as seed heads mature. Infected seeds are often recognized by a shriveled, chalky appearance and seed coats may have a pink discoloration (see image at right). Infections can cause lower grain yields and reduced test weights. Poor quality seed lots may require significant cleanout and seed treatment to obtain an acceptable germination percentage. An additional problem with infected grain is the production of mycotoxins, which may prohibit use of infected seed as a feed source.

Be sure to use the online tool to assess location-specific infection risk of wheat by *Fusarium* spp. The information can be used to make decisions regarding spray applications. The web tool (shown below) can be found online at http://www.wheatscab.psu.edu/. Choose the risk map tool option and select Kentucky. As of mid-May, Don Hershman, Extension Plant Pathologist at UK recommends continued monitoring across the state, but initial expectations are moderate to low risk, but some localized areas may have greater disease pressure and development. Plants are susceptible to head scab during flowering, but weather conditions influence infection and disease development. It is a bit too early to tell, but close monitoring will determine the need for spray applications if necessary.

Heavily infected seed lots may require seed treatment to reduce the impact of FHB infection on germination. A less expensive alternative to application of a seed treatment can be to recondition the seed lot to remove the light-weight, scabby grain, which should be destroyed to prevent spread of the disease.

C. Finneseth
Seed Testing Program

For additional information about head scab and production control methods, information is available from your local County Extension Office and the following resources:

***Head Scab of Small Grains in Kentucky*, PPA 38**
http://www.ca.uky.edu/agc/pubs/ppa/ppa38/ppa38.htm
Small Grains Extension webpage
http://www.uky.edu/Ag/GrainCrops/small_grains.htm
Kentucky IPM Pest Information Pages - Wheat Head Scab
http://www.uky.edu/Ag/IPM/scoutinfo/wheat/disease/headscab/headscb1.htm.

Light colored, shriveled seeds infected with Fusarium head blight.

Plump, uniformly colored wheat seeds, with little to no infection of with Fusarium head blight.

Weed Seed and Noxious Weed Seed Labeling Matters

Most of us readily recognize a weed as being a plant out of place and with less than desirable qualities. Noxious weeds possess the most undesirable characteristics of all weeds and they earn this sinister designation pursuant to state and federal laws. The Federal Seed Act (FSA) and state seed laws contain provisions to limit the amount of noxious weeds contained within seed lots. The FSA regulates interstate shipment of seeds while various state seed laws regulate intrastate seed commerce. Seed companies should be keenly aware of both the FSA and each state's seed law requirements regarding weed seeds and noxious-weed seeds when conducting business across state lines.

The USDA recently updated its publication for *State Noxious-Weed Seed Requirements Recognized in the Administration of the Federal Seed Act*. This document is available online under the publications header at http://www.ams.usda.gov/seed. This is a very helpful document; it provides a listing of noxious weed seed by state and identifies both the common and scientific names of each seed kind. No changes were made to the Kentucky listing for 2011.

In Kentucky, noxious weed seeds are classified as either being "prohibited noxious weed seed," which cannot be present in any amount or as "restricted noxious weed seed," which may only be present in limited amounts within seed lots. Table 1 identifies Kentucky's current noxious- weed seed list and their allowable presence within seed lots. Seed labels are required to identify the name and number of noxious-weed seed per pound if present and in Kentucky any combination of noxious-weed seeds cannot exceed 480 per pound. Additionally, seed may not be distributed in Kentucky if it contains more than two percent weed seed by weight.

Our inspection staff diligently reviews labeling to determine if weed seed and noxious-weed seed labeling items as well as other labeling requirements are being met. Additionally, official seed samples obtained in the field are regularly analyzed for the presence of weed and noxious-weed seeds. Please feel free to contact our office or go to www.rs.uky.edu if you have additional questions about this topic.

C. Thompson
Seed Regulatory Program

Table 1. Prohibited and Restricted Noxious-Weed Seeds in Kentucky

Name of Kind Prohibited Noxious-Weed Seed	Allowed Per Pound
Balloonvine (*Cardiospermumhalicacabum*)	0
Purple moonflower (*Ipomoea turbinata*)	0
Canada thistle (*Cirsiumarvense*)	0
Johnsongrass (*Sorghum halepense* and *S. x almum*)	0
Quackgrass (*Agropyronrepens = Elytrigiarepens*)	0
Name of Kind Restricted Noxious-Weed Seed	
Annual bluegrass (*Poaannua*)	256
Buckhorn plantain (*Plantagolanceolata*)	304
Corncockle (*Agrostemmagithago*)	192
Dodder (*Cuscuta* spp.)	192
Giant foxtail (*Setariafaberii*)	192
Oxeye daisy (*Chrysanthemum leucanthemum = Luencanthemum vulgare*)	256
Sorrel (*Rumexacetosella*)	256
Wild onion/wild garlic (*Allium* spp.)	96

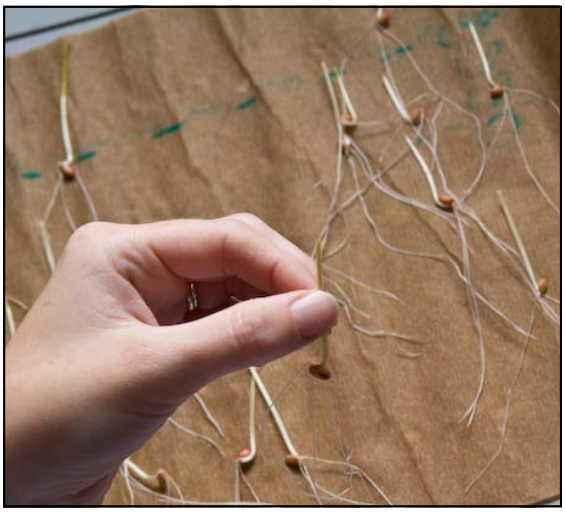
Viability Definitions Commonly Used in Seed Testing

A new definition—**Total Viable**—was recently added to the AOSA Rules for Testing Seeds, which describes the standard principles and procedures that North American laboratories generally follow when testing seed quality for planting purposes.

This term is intended to clarify the various terms used on a laboratory report to describe seed lot viability, which is the potential to produce plants.

Simply stated, total viability is the sum of germination and any dormant or hard seed percentages determined by laboratory procedures. When included on a laboratory Report of Analysis, this value will appear in addition to the percent germination, dormancy and/or hard seed.

Viability definitions extracted from Section 6 of the 2010 AOSA Rules for Testing Seeds follow:



Normal Wheat (Triticum aestivum) seedlings as determined by AOSA standard evaluation criteria.

Seed germination. — In seed laboratory practice, germination is defined as the emergence and development from the seed embryo of those essential structures that, for the kind of seed in question, are indicative of the ability to produce a normal plant under favorable conditions.

Abnormal Soybean (Glycine max) seedling as determined by seedling evaluation criteria used during the standard germination test.

Normal seedlings. — Seedlings possessing the essential structures that are indicative of their ability to produce plants under favorable conditions.

Abnormal seedlings. — All seedlings that cannot be classified as normal seedlings.

Hard seeds. — Seeds that remain hard at the end of the prescribed test period because they have not absorbed water due to an impermeable seed coat.

Hard seeds of Partridge Pea (Chamaecrista fasciculata) which remain unimbibed at the end of the standard germination test.

Dormant seed. — Viable seeds, other than hard seeds, that fail to germinate when provided the specified germination conditions for the kind of seed in question. Viability of ungerminated seeds may be determined by any appropriate method or combination of methods. The percentage dormant seeds, if present, may be reported in addition to the percentage germination.

Dormant Eastern Gamagrass (Tripsacum dactyloides) seed determined by TZ test at the end of the standard germination test.

Total viability. — The sum of percentage germination plus dormant plus hard seeds.

C. Finneseth
Seed Testing Program

2010 Kentucky Labeled Seed Count Survey
Corn, Soybeans and Wheat

In the United States, there is an increasing trend toward selling various seed kinds based on the number of seed per container or bag, rather than by a standard package weight.

In 2010, just over 1500 regulatory samples were collected at firms located in Kentucky for regulatory purposes and of these samples, 216 had a seed count stated on the label. The seed kinds labeled with seed counts were primarily small grains, including barley, corn, oat, soybean and wheat.

Mechanical seed counts were conducted in the laboratory on 183 samples of corn, soybeans and wheat in accordance with the AOSA (Association of Official Seed Analysts) Rules for Testing Seeds. Tolerances of 2%, 4% and 3% were applied to corn, soybeans and wheat, respectively.

Corn

In the 35 corn samples tested, seed counts ranged from 1266 to 2487, with an average of 1697 seed per pound. Forty-three percent (43%) of the samples were out of tolerance with the guarantees stated on the labels.

Soybeans

Seventy-two (72) soybean samples were analyzed for seed counts. The soybean seed counts ranged from 2198 to 1099, with an average of 2884 seed per pound. Thirty-five percent (35%) of the samples were out of tolerance with the guarantees stated on the labels.

Wheat

Wheat seed counts ranged from 11,037 to 19,586, with an average of 13,544 seed per pound. Half (50%) of the 76 samples tested were out of tolerance with the label guarantees.

Of the 78 seed counts that were out of tolerance, nearly all exceeded the label guarantee, meaning the purchaser received at least the number of seeds that were stated on the bag.

Within the corn, soybeans and wheat samples that were out of tolerance with the guarantees, 6 samples (13%, 4% and 8%, respectively) were well below the guarantee stated on the label. For these seed lots, customers would not have received the minimum number of seed per pound stated on the bag.

A similar seed count survey was conducted in 2003 with soybean and wheat samples collected by official sampling methods. Of 89 soybean samples labeled as to seed count, 40% were out of tolerance with the guarantee, 19% of which did not meet the guarantee. In 26 wheat samples tested, 50% of the samples were out of tolerance, with 62% of the out of tolerance samples not meeting the guarantee.

A range of seed counts within a seed kind can be expected because of the cultivar or genetic differences that influence seed size. Moisture content can also influence seed counts, with elevated seed moisture content resulting in lower seed counts on a per pound basis and extremely low moisture contents causing an increased seed count.

Seed size alone should not be used as a basis of seed lot selection. Cultivar characteristics such as yield and quality as well as insect and disease resistance should be carefully considered. Individual seed lot germination and purity analysis found on the tag are also important information when making purchasing decisions.

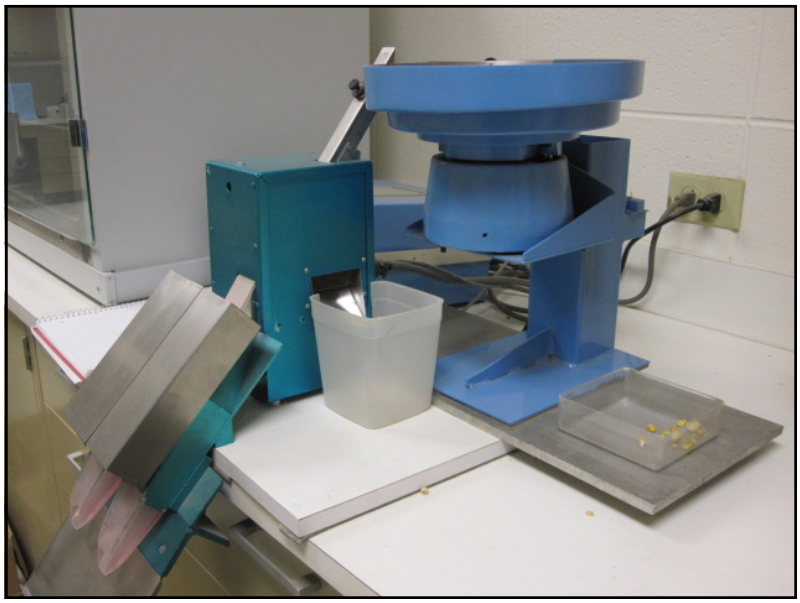
Seed counts can be used to adjust seeding rates. However, alterations to seeding rates must be carefully considered due to potential impact on plant population. To achieve a desired plant density, seed quality, environmental conditions and site-specific concerns must also be considered.

State seed laws are intended to ensure producers and urban consumers of quality seed while promoting fair and equitable competition among seed labelers and dealers. The Kentucky Seed Program focuses on inspection and analysis of products found in the marketplace to ensure that seed labels carry all required information and that seed products distributed and offered for sale across the state are of the quality represented by the label. Although seed counts are not required information on the tag, once stated are subjected to confirmation for regulatory purposes. Because producers are making decisions based on seed counts, the accuracy of this information is crucial.

C. Finneseth
Seed Testing Program

C. Thompson
Seed Regulatory Program

Pure seed units are used for seed counts—no inert matter, small broken seeds or other foreign material. Seeds used for mechanical seed counts are selected at random from the submitted sample. The weight used is based on seed size to achieve analysis of 2500 seed units. The working sample weight for corn and soybeans is 500 g and 100 g for wheat. Tolerances have been established for corn, field beans, soybeans and wheat.



Laboratory Seed Counter Operation
The working sample is placed into the hopper of a seed counter and the machine is started. The hopper vibrates and seeds move through the carousel and are directed into a chute. Seeds are counted as they break a light beam when passing through the chute. Each disruption is recorded and the number of seed per pound is calculated from the number of seeds recorded in the sample weight.

Mycotoxin Analytical Support

In April, Raina Tosheva, Research Analyst at Regulatory Services, travelled to the Southeast Regional FDA (US Food and Drug Administration) laboratory in Atlanta, GA to expand our familiarity with the analytical technology and methods for analyzing mycotoxins in grains and feeds.

It was also important to learn about upcoming trends in FDA rules and regulations that may be implemented in the future, in order to unify the methodology used in regulatory labs in all States.

Mycotoxins are highly toxic and can cause various serious adverse effects on animal and human health. Therefore, the need for analysis and regulation of feedstuffs has increased and become a priority in scientific research leading to advances by the national and international community working in this field.

At this point not all mycotoxins are regulated or tested on a regular basis. However there is a consensus that the most important are aflatoxins, fumonisins, ochratoxin A and DON although some labs are focused on others, depending on regional needs.

The FDA is directly engaged in monitoring and regulating products that contain mycotoxins. To support these activities, sampling and analysis are regularly performed. FDA labs have been engaged in improving the analytical technology used in this field as well.

New methods using modern, sophisticated instrumentation and techniques have been implemented and suggested for use in the future to unify the mycotoxin analysis approach among regulatory labs in the US. Methods include use of Liquid Chromatography (LC) coupled with absorbance, fluorescence, or mass spectrometry detection.

UK Regulatory Services strives to maintain up to date methods and analytical instrumentation for use in the Department. During Raina's stay in Atlanta, she exchanged experiences with one of the leading mycotoxin analytical groups in our region, analyzed samples using their lab equipment, and learned their methods.

Our lab could implement these methods to support our regulatory program efforts in the areas of feed and food safety. Currently, our lab is equipped with most instrumentation needed. However, some investments are needed to upgrade available lab resources with new modules to improve the accuracy of mycotoxin analysis. And last, but not least, implementing the methods used in the FDA lab in Atlanta will help us get closer to meeting the upcoming strict regulations of mycotoxin levels in the feedstuffs.

R. Tosheva
M. Bryant
Feed and Fertilizer Laboratory

A Glance at Mycotoxins

Mycotoxins are secondary metabolites produced by organisms (fungi) that may be harmful to humans and animals when ingested.

Aflatoxins are produced by many species of *Aspergillus* which are a genera of fungi. Common species of interest are *A. flavus* and *A. parasiticus*.

Fumonisins are mycotoxins from *Fusarium* fungi. Of particular importance are *F. moniliforme* and *F. verticilloides*.

Ochratoxin A is an abundant mycotoxin produced by *A. ochraceus* and *Penicillium verrucasum*.

DON (deoxynivalenol) or vomitoxin, is another mycotoxin of interest, produced primarily by *F. graminearum* and *F. culmorum*, and can commonly be found in small grains.

Other mycotoxins of interest include trichothecenes, zearalenone and ergot alkaloids.

The FDA has established action levels for aflatoxins, guidance levels for fumonisins and and advisory levels for vomitoxin. For more information, consult the FDA website: http://www.fda.gov.

Henry Spencer, World War II Veteran, Recognized for Military Service

Mr. Henry S. Spencer, Sr., Auditor at UK's Division of Regulatory Services, is a World War II Veteran. He served with the 1st Marine Division, U.S. Marine Corps, in the Southwest Pacific Theatre of WW II.

In October 2010, Mr. Spencer participated in a visit to Washington, DC with the Bluegrass Chapter of the Honor Flight Network. This organization is a non-profit group, based in Louisville, KY, created to honor America's veterans.

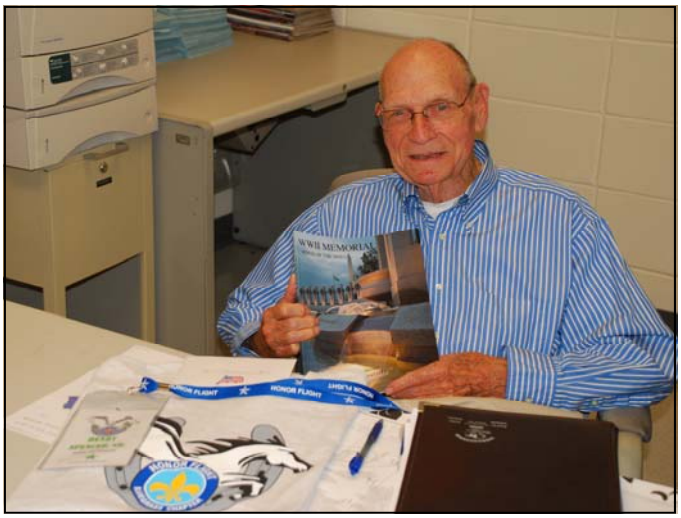
A group of about 40 veterans from the Lexington area flew out of Louisville and visited the National World War II Memorial, the Korean Memorial, and the Marine Corps War Memorial, known as the Iwo Jima Memorial. It was a full day for the tour, which was a 'thank you' for the veterans' service.

"I felt honored to make this trip and was proud to be a part of this group of veterans," said Mr. Spencer. He also was impressed with the caring attitude and compassion shown along the trip at the Louisville and Baltimore airports and in Washington, DC at the National Memorials.

Mr. Spencer received a Bluegrass Chapter tee shirt, ticket and ID holder, a personal note of thanks, a memorial booklet with facts and pictures, and many memories from his trip. Mr. Spencer also received his commission as an Honorable Kentucky Colonel during this trip, becoming Colonel Spencer.

We are honored to have Mr. Spencer in our Department. I have enjoyed talking with him about his trip to the Memorials and the time he spent in the armed services of our nation. His action included the Battle of Guadalcanal ('42-'43), the Battle of Cape Gloucester (New Britain, '44), and the Battle of Peleliu ('44). Mr. Spencer's name appears in the National WW II Registry of Remembrances.

Melton Bryant



Honorable Henry Spencer with memorabilia from the trip to Washington, DC.

The Honor Flight Network Bluegrass Chapter

There are over 30,000 World War II veterans living in Kentucky. The Bluegrass Chapter Honor Flight program is dedicated to providing the opportunity for these veterans get to see the World War II Memorial in Washington, DC. Chaperones also travel with participants to assist them on the trip. Honor Flight, Kentucky Veterans Program Trust Fund, and other sponsorships provide trip assistance so there is no cost to our veterans. The Honorable Order of Kentucky Colonels sponsored the October 2010 Bluegrass Honor Flight. For more information visit: www.honorflightbluegrass.org.

The World War II Memorial, Washington, DC

The World War II Memorial commemorates the 16 million American men and women who served during WW II. There are less than two million living veterans of this war. The National Park Service held a dedication for the Memorial on May 29, 2004. The Memorial consists of 56 pillars representing the United States and the eight districts or territories, iconic relief scenes, arches, quotations, 4048 gold stars, and includes the Rainbow Pool. For more information visit: http://www.nps.gov/nwwm/index.htm.

Announcements

New Regulatory Inspector: Bart Young

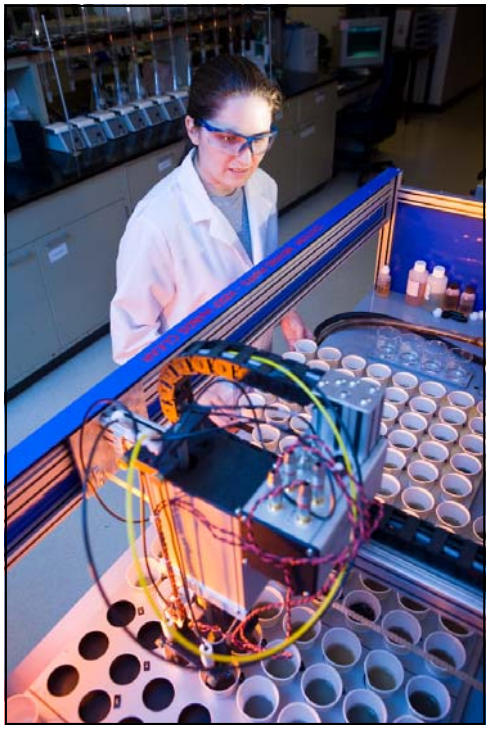
Bart Young

The newest inspector for the Division of Regulatory Services is Bart Young. Bart started his position with Regulatory Services on March 14th. He has a Bachelor of Science from the University of Kentucky in Agriculture and has over 14 years of experience working in sales, distribution, and management in the wholesale feed industry.

Bart's area of responsibility will include the 11 counties of Bullitt, Carroll, Franklin, Gallatin, Henry, Jefferson, Oldham, Shelby, Spencer, Trimble, and Woodford. In addition to these counties he will have Boone, Kenton, and Fayette counties for specialty products. Specialty products include small package seed, and fertilizer as well as pet food and the specialty feed products. When discussing the new territory with Steve McMurry, the Fertilizer Coordinator, and Chris Thompson, the Seed Coordinator, we believe having an inspector focusing part of their time on specialty products was important to the consumers of these products.

Bart lives in Lexington with his wife Laura, his two daughters Madeline, and Willa, and his son Lucas. He is originally from Christian County.

Lexington Soils Lab has a New Supervisor: Diane Hunter



Diane Hunter operating the robotic pH analyzer.

The Lexington Soils Lab began the day on February 28th with Diane Hunter as the new supervisor. Diane was raised in Owensboro, KY. She received two associate degrees: one in Biological Sciences at the University of Kentucky Owensboro Community College and one in Environmental Science Technology at University of Kentucky Lexington Community College. She received a B.S. in Soil Science in 2004 at New Mexico State University. Diane has been working in the Lexington Soils Lab as a Senior Laboratory Technician since the fall of 2005.

It was an interesting time to begin as supervisor in the lab since March is the busiest time of year when over 400 samples are received per day. With the off and on rains this year, the daily samples received did not increase to very extreme levels and Diane did a good job of managing acceptable turnaround times on testing.

Diane's family includes a husband and preschool daughter. Her husband, John, is also quite familiar with soil, being an archaeologist who travels to various sites throughout the country to dig and search for human artifacts.

If you have not yet met Diane and are in the area, feel free to drop by and introduce yourself.

Announcements

Upcoming Events

UK All Commodity Field Day — July 21
U.K. Research & Education Ctr.
Princeton, KY

Cindy Finneseth

Seed Testing Program Staff Change

June 1, 2011 will be the last day at Regulatory Services for Cindy Finneseth, Seed Testing Coordinator. She has accepted a position outside the University. Until her position is filled, automatically-generated emails of laboratory sample reports sent to your inbox will be sent from the Seed Staff Associate, Emily Jean Hicks.

Kentucky Seed Issues

The Seed Regulatory and Testing Programs publish a monthly newsletter of interest to individuals and firms using, buying or selling seed in Kentucky and the surrounding region.

Anyone is welcome to subscribe. To add yourself, send an email to ListServ@lsv.uky.edu with no subject. In the body of the message include the following line of text:

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